TEXTILE READER'S GUIDE

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Abstracts

FIBERS A

Rapid identification of fibers

Braham Norwick. *Textile Res. J. 23,* 259-61 (1953).

The Christiansen effect is used for the rapid identification of a number of fibers. The only change in the procedure was the use of Polaroid thru which the fibers were illuminated. The refractive index for each fiber is given. The test liquids consisted of blends of acetyl acetone, anisol, oil of fennel, butylcarbitol, and chloronaphthalene, the blends covering the range from 1.47-1.615 in steps of 0.005.

Soiling and soil retention in textile fibers

W. J. Hart and Jack Compton. *Textile Res. J. 23,* 418-23 (June 1953).

The objective of the present investigation was to determine the relative importance of macro-occlusion due to yarn and fabric construction on the soil retention of fabrics. The physical factors affecting the reflectance of soil-fabric systems are also given detailed consideration.

Natural Fibers A 1

Better mercerizing for improved luster

Lyman Fourt and Arnold M. Sookne. *American Dyestuff Reporter 42,* P-587 (August 31, 1953).

Mercerizing is the most widely practical means of improving the luster of cotton, and can be one of the most effective. However, some of the other objectives of mercerization, such as improved dye uptake, or modified strength or elongated properties, are not completely compatible with high luster development, so a compromise is usually made. The degree of luster obtainable by mercerization is also limited by the kind of cotton used, the twist and plying of the yarns, and in woven goods, the pattern of interlacing and the cover factor or compactness of weaving.

Taking account of the limitations which arise outside the mercerizing process itself, there are additional factors within the mercerizer's control, which will influence the results on yarn or fabric made from any kind of cottons in any construction. These are:

1) Time of exposure to caustic, and distribution of this time between relatively slack and relatively stretched conditions.

2) Extent of exposure to caustic; degree of penetration.

3) Temperature and concentration of caustic.

4) Sequence of mercerizing with respect to other operations such as reliance on absorption or accessibility tests, such as barium number, can be misleading. The guidance of physical measurements of optical properties, however, can usually lead to noticable improvement in luster.

Cotton—an old fiber with a new future

Leonard Smith. *American Dyestuff Reporter 42,* P-387 (August 31, 1953).

Through breeding research in recent years, cotton has improved in length and strength, and different fiber diameters are available. By physical treatment, it is now possible to produce cotton of increased luster, of greater or lesser crystallinity at will. The importance of these changes, in terms of yarn and fabric performance and in terms of response to chemical treatment, is receiving further study. A polyhydric alcohol, cotton reacts chemically to yield fibers of startlingly different characteristics. The esters and ethers which it forms are proving valuable in many diverse uses. Because of its excellent bonding properties, cotton responds to treatment with a wide variety of finishes and coatings which make it more serviceable in specific markets. The versatility of cotton has long been recognized. Research is now converting cotton into specialty fibers designed to give ultimate performance in particular uses. (AATCC Paper).

Cotton cellulose with reduced crystallinity

Leon Segal, M. L. Nelson and Carl M. Conrad, *Textile Research Journal 23,* 428-435 (June 1953).

Further studies have been made of the variables in the application of anhydrous ethylamine to cotton cellulose. The crystallinity of the product has been estimated by means of the acid hydrolysis residue method. Indication of crystallite length has been obtained by the use of the "leveling-off" degree of polymerization. Reduction of crystallinity has been shown to take place rapidly and to be independent of the degree of polymerization of the cellulose. The maximum reduction in crystallinity was found to occur in material that was free of tension. Crystallite orientation was essentially unaffected by the treatment. The

cellulose II pattern was always found in the cellulose after contact with mercerizing caustic, regardless of the sequence of treatment.

Dyeing characteristics of different wool grades

Henry E. Millson. *American Dyestuff Reporter 42,* 586 (August 31, 1953).

Objects of this study were the dyeing properties of four wools: Australian Fine, a New Zealand Medium, Domestic Fine and Domestic Medium. Considerable difference in depth of shade was obtained by tests, and analyses revealed that these differences are directly related to the fiber fineness. One wool grade equals a five percent difference in depth of shade.

In addition to the study of the four wools in piece form, dyeing studies were also made on top and staple. In this study were included acid, metallized, and chrome dyestuffs. Spectrophotometric analysis of the dye liquor during practical dyeing shows that there was no difference in the amount of total exhaustion from the dyebath between the four wools. Slight differences in the rate of exhaustion are present.

Modification of wool by "Chlorination" processes, and effect on wear-life

D. Frishman, M. Harris. *American Dyestuff Reporter 42,* P-586 (August 31, 1953).

Shrink-resistant wool is most widely produced today, according to this AATCC paper, by many of the so-called "chlorination" processes. There is a general tendency to consider all such processes and their effects on the overall in the degree of shrink resistance obtained and in the extent to which they modify other desirable properties of the fiber. The present discussion considers the fundamental basis for these differences on the useful life of treated materials as determined through actual wear tests. Data is presented which confirms the utility of the alkali-solubility test as a measure of the changes produced in wool by oxidative treatments.

Practical aspects of wool scouring

R. E. Wolfrom. *American Dyestuff Reporter 42,* 586 (August 31, 1953).

The abstract of this AATCC paper shows only in a general way the scope of the author's paper, which is concerned with the scouring of grease wool with nonionic detergents. Engineering data is given by this paper on detergents and control measures during the run; cost calculations comparing various detergents are also presented.

Tensile behavior of some protein fibers

G. Susich and W. Zagieboylo. *Textile Res. J. 23*, 405-417 (1953).

The tensile properties of wool, mohair, human hair, casein, Vicara, and silk, including their behavior when knotted, after repeated stresses and when swollen in water were investigated. The immediate elastic recovery, the delayed recovery, and the permanent set of these fibers were measured by means of a cycling technique using the Instron tensile tester and the Sookne-Harris fiber extensometer. Actual and relative values of elongation components under different testing conditions are demonstrated graphically from the beginning of the stretching procedure up to rupture.

Artificial fibers A 2

Acetate blends of improved performance

F. Fortess, B. S. Sprague, and R. G. Stoll. *American Dyestuff Reporter 42*, P-584 (August 31, 1953).

Balancing the physical characteristics in blends is the problem outlined by this abstract of the AATCC paper which contains data on acetate-viscose and acetate-viscose-nylon blends having optimum performance characteristics. Different finishing techniques were used on acetate blends to enhance further the performance characteristics described. Improved color fastness on acetate-viscose and acetate-viscose-nylon blends were presented, using commercially feasible techniques. Acetate-wool blends are mentioned insofar as the effectiveness of acetate in producing fabrics with wool-like performance characteristics is concerned.

Dynel inner structure

T. A. Field, Jr., C. A. Setterstrom, and C. W. Davidson. *American Dyestuff Reporter 42*, 584 (August 31, 1953).

Isolation of each of the separate fiber structures is outlined by this abstract of the AATCC paper as a means for determining the influence of each fiber on dimensional stability, color, lightfastness, uniformity of blending, damage from excessive heat, abrasion, loft, and pleat retention of the original fabric. Methods of preparing inner structures of dynel and other fibers are detailed and the adaptability of the technique to a wide range of fiber blends is suggested.

High polymerized rayon

Shozo Tachikawa. *Modern Textiles Magazine 34*, 67-8, 77 (July, 1953)

Charts and tabular data are presented comparing high D. P. rayon with ordinary rayon.

Laundering properties of the science fibers

George H. Johnson. *American Dyestuff Reporter 42* 584 (August 31, 1953).

Fiber identification by launderers, especially in case of blends, is almost impossible. Launderer, therefore, sets up only general classifications of fabrics for proceeding. Problems experienced to date with dynel were due to low melting of this fiber. Dynel hose dried on steam-heated forms fuse and shrink; similar hose, when tumbler-dried, sometimes tend to shrink gradually; undyed nylon and Orlon may become darkened when pressed.

The wash and light fastness of various nylon, Orlon, and wool blends have not always been of the best. Bleeding and poor resistanse to perspiration are not uncommon. Some Orlon-wool blends shrink when pressed. Spun yarns in men's hosiery have tended to "pill". The greatest difficulty of all has been the tendency of some of the science fibers to form extractor wrinkles that cannot be removed by pressing.

Synthetic fiber developments in Europe

G. Abrahamson. *Chem. and Eng. News 31*, 2996-7 (July 20, 1953).

A thumb nail sketch is given of the fully synthetic fiber developments in Europe: Nylon, Ardil, Perlon and Grilon are among those mentioned.

YARN PRODUCTION B

Fiber Preparation B 1

Blending hopper

Kenneth G. Lytton. U. S. P. 2,645,820 (July 21, 1953).

A blending hopper comprising a housing having a fiber stock inlet, an outlet and a conveyor vertically spaced below the inlet, and means for delivering the fiber from the conveyor to the outlet including a plurality of rotary members carried by the housing, one of the members being disposed adjacent to the conveyor and having a plurality of tires, a baffle assembly having a plurality of passages and disposed between the one of the rotary members and the conveyor to stop the movement of fiber in the housing and thereby form a bank of the fiber, and the tires being operable in the passages to draw some of the fiber from the bank, the baffle assembly comprising a first and a second baffle section having confront-

ing ends hingedly connected together, and means for moving the first section hingedly relative to the second section causing the baffle assembly to move inwardly toward the one of the rotary members to increase the amount of penetration of the tines into the passages and hence into the bank of material.

Staple detwisted yarns

Mamerto M. Cruz, Jr. (American Viscose Corp.) ; U. S. P. 2,638,734 (May 19, 1953).

The method of making staple detwisted yarn from highly twisted yarn comprises passing the yarn through a polyhydroxy compound solution (hydroxy ethyl cellulose), drying the yarn, and removing twist therefrom whereby the compound remains in continuous condition on the yarn.

The tow stretch breaking apparatus

Donald G. C. Hare (Deering Milliken Research Trust) ; U. S. P. 2,638,634 (May 19, 1953).

The method of treating tow comprises stretch breaking the tow in a drafting mechanism while applying heat moisture to the tow at the nips of the feed rolls to concentrate breakage at the nips.

Carding and Combing B 2

Transfer of wool fiber to a worker from a swift

P. P. Townsend. *Wool Review 26,* 37-40 (June 1953).

A series of experiments conducted by this member of the University of Leeds staff shows the effect of recent wool carding studies on the transfer of wool fiber from the worker to a swift, the experiments being analyzed for the results obtained by varying the surface speeds of the worker and swift, studying the rate of production, the condition of the card clothing, the density of the card clothing, and other factors. Current practice is fairly well substantiated by these studies, except that finer settings are visualized so that workers on the back of the card may be set more closely than normally in order to obtain the full benefit of every worker on the card.

Spinning B 4

Ball bearing top roll

Louis M. Cotchett (Textile Engineering Corporation) ; U. S. P. 2,644,202 (July 7, 1953).

A top roll for drawing mechanisms comprising a shaft, two sleeves encircling the shaft and

spaced axially apart, anti-friction bearings supporting the sleeves in coaxial relationship to each other and to the shaft, one at least of the bearings including a cone avially adjustable on the shaft and combined with a cap for the end of the shaft, and means substantially enclosed inside of the cap but operable from a point outside of it for locking the cap to the shaft, the cap having an axial hole therethrough, smaller than the locking means, through which a tool may be inserted to operate the locking means.

Bobbin stripper

Wm. V. Goodhue and Robert E. Morton (Universal Winding Co.) ; U. S. P. 2,638,658 (May 19, 1953).

A bobbin stripper comprises means for withdrawing yarn from the bobbin, means for testing each bobbin to detect whether the yarn has been completely removed, and means to segregate bobbins which still have yarn thereon.

Drafting mechanism for textile fibers

Joseph Noguera (to Casablancas High Draft Co) ; U. S. P. 2,645,823 (July 21, 1953).

In drafting mechanism of the class wherein a weight acting through a flexible connection urges an underclearer against the under periphery of at least one bottom roller with the intermediate portion of the flexible connection slidably supported by the drafting mechanism to provide an underclearer leg attached to the underclearer and a weight leg supporting the weight, characterized by the fact that the weight leg has a loop, and the weight has an annular groove removably received in the loop.

Drafting rayon tow

Virgil A. Burham. *Saco Lowell Shops;* U. S. P. 2,640,228, (June 2, 1953).

The rear rolls of drafting mechanism comprises a driving roll and two additional rolls wherein the strand makes a partial wrap around a driven roll and then around the driving roll to provide two bites through which the strand runs.

Drafting textile fibers

Wilford J. Cabana (to Uxbridge Worsted Company, Inc.) ; U. S. P. 2,645,822 (July 21, 1953).

The method of attenuating a strand of fibers which comprises passing the strand longitudinally between a pair of spaced longitudinally moving surfaces, causing the surfaces to converge continuously along the path of travel of the strand,

thereafter bending the surfaces in a serpentine path to apply lateral thrust to the fibers, and drawing the strand between the surfaces in the same longitudinal direction as the direction of travel of the surfaces.

Factors affecting spinning limits

E. B. Grover and D. S. Hamby. *Textile Industries 117*, 114-116 (August, 1953).

Spinning limit is determined by the number of fibers in the cross section of the yarn, a factor which, in turn is affected by the fiber length, strength, and fineness, and other considerations. The article shows how to figure the number of fibers in the yarn cross section, how many fibers are needed, and the relationship of these elements to yarn evenness.

Five-roll double-draft frame

James D. Friday and William F. Stilwell. U. S. P. 2,644,201 (July 7, 1953).

In a spinning frame, a roving-drafting apparatus of the character described, comprising a first pair of fluted rolls, a second pair of fluted rolls, a smooth roll located between the first and second pairs, all of the rolls being parallel and being coplanar, a first gear train coupling the outer roll of the second pair to the outer roll of the first pair, a second gear train coupling the outer roll of the second pair to the inner roll of the second pair, both of the gear trains being formed and arranged to drive the outer roll of the first pair and the inner roll of the second pair in the same direction but at reduced speed with respect to the outer rolls of the second pair, a third gear train coupling the outer roll of the first pair to the enter roll of the first pair for simultaneous rotation in the same direction, a fourth gear train coupling the smooth roll to the inner roll of the first pair for simultaneous rotation in the same direction, respective pressure rolls overlying and engaging the respective flute rolls, a cleaner roller disposed in sub-adjacency to and parallel with the first pair of fluted rolls, pivoted levers supporting the roll, the levers being mounted from movement about and axis parallel with the axis of the first pair of fluted rolls and weighted elements associated with the levers for retaining the roller in fractional engagement of the outer roll of the first pair, the rollers of each pair being spaced a distance less than the space between pairs.

Roving forming apparatus

Norman E. Klein (Deering Milliken Research Trust) ; U. S. P. 2,641,804 (June 16, 1953).

A staple fiber roving producing apparatus comprises sliver feeding rollers, and endless belts driven at a greater speed than the feeding rolls and which converge at a point to provide a gripping contact with the sliver traveling therebetween to break the fibers therein.

Spindle adapter

Ernest Bay (Owens-Corning Fiberglas Corp.) ; U. S. P. 2,639,576 (May 26, 1953).

The invention relates to apparatus for twisting strands of textile and other fibers at high speeds wherein adapter means are provided which permit the use of spindle spools of different inside diameters without the necessity for changing spindles.

Textile roll assembling and disassembling apparatus

Robert R. Elliott, Sr., (to Whitin Machine Works) U. S. P. 2,644,224 (July 7, 1953).

Apparatus for use in joining or for separating a pair of fluted boss type textile drawing roll sections which are arranged for interfitting axial connection in end-to-end relation with each other, and for use in association with a small portable hydraulic ram unit having a cylinder with a moveable plunger therein operated hydraulically by a pump unit.

Yarn tension

Maurice R. Flamand (to Draper Corporation) ; U. S. P. 2,643,831 (June 30, 1953).

A yarn tension device comprising in combination a holder, flexible, thin, flat yarn engaging members each of which is restrained at both of its ends by the holder and between which a yarn to be tensioned is drawn, and a means for deflecting the yarn engaging members to bow them lengthwise thereby to increase the amount of tension to be imposed thereby.

Winding and Spooling B 5

Cop handling mechanism

James G. Gamble (to Paul Whitin Manufacturing Co.) ; U. S. P. 2,646,226 (July 21, 1953).

The combination with a cop winder having a plurality of winding heads, of an endless belt conveyor disposed to pass along the array of winding heads, and to one end of the array, cop carriers on the conveyor to receive cops from the heads, a support at the end of the array of winding heads for a cop-receiving rack, the conveyor crossing

the support, at least one guide to guide cops form the carriers to empty spaces on cops individually directly from the carriers for empty spaces on the rack.

Double-twist spindle

Karl Landolt. U. S. P. 2,641,896 (June 15, 1953).

In a double-twist spindle a normally stationary thread guiding surface has a projecting portion adapted to engage a fixed member disposed externally of the member disposed externally of the unit upon rotary movement of the stationary unit to prevent further rotation of the unit.

Magnetic stopping device

Ingham S. Roberts (American Viscose Corp.); U. S. P. 2,640,310 (June 2, 1953.)

In a winding and twisting system, there is provided on a package supporting member a magnet which will move into cooperating relationship with a magnet secured to a yarn breaking element to move the element into the path of the traveling thread should the supporting member rotate.

Properties of tensioning devices

J. A. Kalman. *Enka Breda Rayon Revue 7*, 54-66 (May, 1953); in Dutch.

For a larger number of tensioning devices the minimum and maximum tensions were measured, occurring in warping low-twisted rayon yarns at different speeds. The tensioning devices have been classified according to their tensioning action. In order to be able to evaluate the effectiveness of the tensioning action, use has been made of the concepts "unsteadiness" and "sensitivity to speed".

Stop motion

Phillip N. Smith (Deering Milliken Research Trust); U. S. P. 2,644,221, (July 7, 1953).

An electronic stop motion for textile machines is claimed.

Tensioning device

H. L. Roder. *Enka en Breda Rayon Revue 7*, 45-53 (May, 1953); *in Dutch.*

In this article attention is drawn to three recent interrelated developments: crepe yarns delivered on cones; a tensioning device developed by AKU, indicated as "AKU-balancing tensioning device"; a creel developed by N. V. Machinefabriek L. te Strake at Deurne (N. Brabant). A description is given of the conditions which must have been satisfied in general, in order to attain

optimum results in warping normal rayon yarns, Enkalon yarn and crepe yarns. By combining the three developments mentioned above it has become possible to wrap crepe yarns at speeds up to 600m/min.

Yarn marking device

Ernest K. Bauer (American Viscose Corporation); U. S. P. 2,644,423 (July 7, 1953).

The invention relates to marking continuous running strands at regular and predetermined intervals during the winding of the yarn upon a collection device.

Yarn applications B 9

Bonding rayon yarn to fiber

Donald Entwistle (Courtaulds Ltd.); U. S. P. 2, 643,207, (June 23, 1953).

A process for bonding rayon to rubber comprises distributing within the filamentary structure of the rayon yarn a resin adhesive obtained by the condensation of an aldehyde and a phenol, placing the yarns in contact with unvulcanized rubber, and thereafter vulcanizing the assembly.

Keratinous yarn treatment

Oscar P. Cohen (Monsanto Chemical Co.); U. S. P. 2,642,332 (June 15, 1953).

A process for setting the twist in keratinous yarns consists in treating the yarns with a dispersion comprising dispersed particles and an aliphatic mercapto alcohol and then drying the yarns.

Liquid applicator for yarns

Henry J. McDermott (American Viscose Corp.); U. S. P. 2,642,035 (June 16, 1953).

An annular shaped liquid applicator for yarn comprises an upper and a lower recess portion connected by an aperture through which a strand passes, and means extending through the applicator wall into the upper recess for supplying liquid thereto.

FABRIC PRODUCTION C

Yarn Preparation C 1

Bulk starch handling at Avondale

Staff. *Textile Industries 117*, 108-109 (August, 1953).

Railroad-hopper-car delivery of starch replaces bag delivery at Avondale, saving more than 40 man hours in unloading time, saving pearl-

price differentials in starch costs. The bulk starch handling system was worked out by Fuller Company, Catasaqua, Pennsylvania.

Linseed oil sizing

C. Pinte and Miss Essertel. *Bull. L'Inst. Textile de France.* No. 38, 31-38 (April, 1953); in French.

The action of fugitive dye-stuffs was studied according to whether they were applied previously or incorporated in one benzene solution of linseed oil. In both cases, but more particularly in the second, a distinct reduction was observed in the speed of polymerization of linseed oil and a noticable limitation of chemical deterioration of rayons, more particularly of rayons aged after sizing. The reduction in polymerization speed is such that the sized yarn may remain sticky after drying, if the percentage of dyestuff used in the benzene solution reaches or exceeds 1%.

Slasher roll

Joseph Rockoff (The Dayton Rubber Company); U. S. P. 2,643,436.

A slasher roll for the controlled application of sizing material to textile fibers and yarns in textile sizing machines which comprises a surface layer of milled rubber having a substantial proportion of wool fibers intimately dispersed therein.

Weaving C 2

Auxiliary cloth winding means for looms

Milton Ray Harden (to Erwin Mills, Inc.); U. S. P. 2,644,490 (July 7, 1953).

In a loom having driven sand roll, the combination of a cloth winding apparatus having a fixed frame, a roll in the fixed frame driven by the sand roll, a pair of spaced support bars, the support bars being adapted to support a lap pin, means pivoting one of the ends of the support bars to the fixed frame at points adjacent to but at a lower level than the driven roll, whereby when the free ends of the support bars are into contact with the driven roll, an oscillatable shaft mounted in a lower portion of the fixed frame and having a lever fixed thereto, a first pair of links having one of their ends secured to the oscillatable shaft, a second pair of links having their upper ends pivotally securing the lower ends of the second pair of links to the upper ends of the first pair of links and means for latching the lever against movement when the first and second pairs of links are in alinement with each other.

Fabrics without filling

F. Bloch, *Industrie Textile 69,* 551-2 (1952); *in French. Chem. Abs. 47,* 4616 (May 10, 1953).

Two layers consisting of parallel yarns laid across each other are glued and compressed together. This method is very efficient in producing large quantities of fabriclike textile structures at low cost. Described is the manufacturing of such nonwoven textiles containing (1) freshly spun cuprammonium cellulose filaments, (2) cotton glued with a solution of cellulose acetate, (3) an assembly of viscose acetate rayon, and cotton bonded by passage through hot cylinders, (4) viscose rayon bonded by a $Ca(CNS)_2$ solution, and (5) cellulose fibers impregnated by a solution of cellulose in cuprammonium.

Ornamental fabric

Wm. E. Stanley and Fred Brown (British Celanese Ltd.); U. S. P. 2,639,488 (May 26, 1953).

A process for producing an ornamental knit fabric comprises subjecting a knitted fabric comprising alternate groups of cellulose ester yarns and synthetic linear polymer yarns to a hot aqueous treatment.

Reed for textile purposes and method of making same

Matthew Michael Taylor (to British Celanese Limited); U. S. P. 2,643,684 (June 30, 1953).

A method of making a reed for textile purposes, the method comprising securing a series of reed wires at the top and at the bottom of the wires between a pair of longitudinal members by binding round and round the pair of members a yarn having a content of thermoplastic textile fibers and a content of other textile fibers while disposing each reed wire between two successive turns of the yarn, and then softening the thermoplastic fibers of the yarn so as to fix the yarn, the reed wires and the longitudinal members relatively to one another.

Tension control device for looms or the like

Christian Christiansen and Gustav Karl Rusch, U. S. P. 2,646,079 (July 21, 1953).

A circular loom comprising a weaving ring at the upper edge of which the ring is effected, a sector mounted on a sector carrier for rotation above the upper edge of the weaving ring for pressing the weft thread between the warp threads, at least one guiding pin for the weft thread mounted on the sector carrier and a device for controlling the tension of the weft thread,

characterized in that the tension controlling device comprises a cylindrical rod secured to the outside of the sector carrier in the main parallel with the same and so situated relatively to the guiding pin that the weft thread passes directly from the guiding pin to the rod, and guiding means leading the thread from the rod, the guiding means being arranged at some distance from the point in which the thread is led to the rod, the sector carrier having an aperture through which the thread is passed to the weaving point.

Warp tension let-off device for looms

Louis Ritsky, U. S. P. 2,646,081, (July 21, 1953).

In a loom, a rotative warp beam, a drum carried thereby, a plurality of brake band segments overlying the drum, the segments being adjustly connected at one end, the opposite end of each segment being provided with a lug, spring means for urging the lugs toward one another, a lever interposed between the lugs and connected to one of the lugs, and a stop element for the lever adapted to incline the lever when the warp beam is under pull of the warp threads to thereby cause the lever to pry the lugs apart to release pressure of the brake band segments on the drum.

Weaving shuttle with round bobbin

Ernst Egli (to Maschinenfabrik Ruti A. G.); U. S. P. 2,643,685 (June 30, 1953).

A weaving shuttle having a cavity extending entirely therethrough for the reception and accommodation of a bobbin having a cylindrical base, comprising separable walls and resilient means urging the walls together, the walls including cooperating oppositely disposed surfaces forming entry and exit passages and retaining means for the bobbin base, the retaining means being disposed between the entry and exit passages and comprising opposite arcuate surfaces having a curvature corresponding to the curvature of the cylindrical base of the bobbin, the surfaces, forming the entry passage having mutually opposed projections thereon affording a restricted entrance into the retaining means, the distance between the projections being less than the diameter of the bobbin base and less than the distance between the surfaces forming the exit passage, whereby the base of a fresh bobbin as it is forcefully inserted into the entry passage and contacts the mutually opposed projections will effect separation of the walls of the cavity sufficiently to permit the old bobbin to fall freely out of the shuttle as the new bobbin takes its place.

Yarn tension device

Maurice R. Flamand (Draper Corp.); U. S. P. 2,643,831 (June 30, 1953).

A yarn tension device comprises thin flat yarn engaging members between which a yarn is drawn, and means for bowing the members to increase the amount of tension on the yarn.

DYEING AND PRINTING E

Adsorption isotherms of direct dyestuffs

Henri Wahl. *Bull. L'Inst. Textile de France. No. 38,* 39-61 (April 1953); in French.

The constancy of affinity for cellulose in various states, and of the heat of dyeing, of one and the same dyestuff, shows that the dye becomes fixed according to a single process. These results are studied from the point of view of the dyeing process. Dyeing involves the geometrical structure of the dye, the accessibility of nonorientated zones of cellulose and requires that the dyestuff contain groups capable of constituting hydrogen bonds with the OH groups of the cellulose.

Application of Calcofast dyes to wool

Henry E. Millson. *American Dyestuff Reporter 42,* 586 (August 31, 1953).

In contrast to milling dyes, Calcofasts level best when applied from a strong sulfuric acid dyebath. Microscopical studies have shown that while pH is important, the kind of acid used has a greater influence upon leveling and distribution of these dyes that does the pH. Kodachrome slides were used to illustrate the difference in levelness obtained at the same pH with acetic, phosphoric, and sulfuric acids. The higher the concentration of sulfuric acid, the greater the amount of dye which remains in the "exhausted" dyebath.

Penetration of Calcofasts is retarded in those areas of the wool fiber where the epicuticle and scales are intact. Penetration can be aided by increasing the concentration of sulfuric acid or by the use of surfaceactive leveling agents. Studies with the Microdyeoscope have shown that most nonionic surfaceactive agents are safe to use and less liable to cause trouble than cationic surfaceactive agents. It was found that strongly cationic agents generally react with Calcofasts and cause precipitation of the dye, resulting in the formation of an insoluble scum which is difficult to remove when it adheres to wool yarn or fabric. Care must be exercised in the use of sequestering agents. An excess may bring about

demetalization of the metalized dyes. (AATCC Paper).

Dyeing textiles in a superheated bath

Baldwin Steverlynck. *Textil-Praxis 8*, No. 1, 59-62 (1953); in German.

A description is given of the Steverlynck superheated dyeing machine in which the dye liquor is circulated by a low-pressure pumping system. The dye vessel is virtually an autoclave in which temperatures of over 100° C. are attained. Facilities are available for making additions to the liquor and making sample dyeings. Rapid heating and cooling is effected by a heat-exchange device. The machine is designed primarily for the dyeing of packages within a short period of time, and excellent results are reported for cotton, rayon and synthetic fibers.

Modified dye jigger

B. P. Flanagan and H. Mulnall (Brit. Celanese Ltd.); B. P. 687,932, (February 25, 1953); *British Rayon and Silk J. 29*,76 (June,1953).

When fabrics which tend to swell are dyed in a dye jigger, the more compact selvedges do not swell as much as the body of the fabric making for an uneven build-up on the draw rollers. This is avoided by giving the curved fabric-spreading roller immediately in front of the draw roller a horizontal reciprocating motion. This produces a slight stagger (¼-¾ in.) of the selvedges in the build-up resulting in an even or level roll and more even dyeing.

Recent advances in dyeing Orlon and Dacron

J. F. Laucius. *American Dyestuff Reporter 42*, 584 (August 31, 1953).

Emphasis is upon the dyeing of blends of of the two new fibers with presently available fibers. A complete summary of recent innovations is presented, including dyeing Orlon with dispersed, vat, and basic dyes, and the cuprous ion method of dyeing the same fiber, especially with regard to reducing agents, a selection of dyes, and temperature of dyeing. In the dyeing of Dacron with dispersed colors, the status with reference to carriers and pressure dyeing is given.

Reciprocating doctor blade mechanism

Henri E. Peyrebrune and Benjamin L. Sites (to Miehle Printing Press and Manufacturing Company); U. S. P. 2,644,395 (July 7, 1953).

In an intaglio printing press of the class having a reciprocating doctor blade for removing excess ink from a printing form, mechanism for

actuating the doctor blade, mechanism having operation to rock the supporting shaft and therewith the doctor blade bodily about an axis coincident with the wiping edge of the blade to thereby vary the angle of the blade with respect to the printing form.

SPECIAL FINISHING F

Acrylic resins in textile processing

A. C. Nuessle and B. B. Kine. *Ind. and Eng. Chem. 45*, 1287-93 (June, 1953).

The wide variation in physical and chemical properties of the acrylic polymers and their utility in application were investigated. The acrylics are outstanding in resistance to deterioration by heat, light, chemical fumes, weathering, and aging. Adhesion to textile fibers varies somewhat with polymer composition. Polyacrylic acid has excellent specific adhesion to nylon and enjoys considerable use as a warp size. With sufficient heating, it will combine chemically with nylon to give a very durable finish.

Coating cotton fabrics

Wm. R. Stanton (Textuff Ltd.); U. S. P. 2,639,966 (May 26, 1953).

A process for coating a cotton fabric with cellulose comprises treating the fabric with a cotton wetting agent, passing the wetted fabric through a viscose bath, coagulating the viscose, and continuously filtering the viscose bath to remove cotton fibrils.

Flame proofing fabrics

Leslie P. Seyb and Clifford A. Neros (Diamond Alkali Co.); U. S. P. 2,640,000 (May 25, 1953).

The invention provides for the treatment of fabric with both flameproofing and water-repelling substances wherein the agents are maintained in entirely stable relationship at ordinary temperatures but coact in flame retarding relationship upon exposure of the fabric to flame temperature.

Heat setting of textiles

Lasil Ltd.; B. P. 691, 370 (May 13, 1953).

A process for heat setting textile materials containing organic polymers such as polyamides, cellulose derivatives, etc., comprises immersing the textile material in a bath of molten metal which is non-reactive chemically with the textile material.

Identification of textile finishes

Ray Krammes and Charles Maresh. *American*

Dyestuff Reporter 42, 317-27 (May 25, 1953).

A removal-by-solvent method of analysis of textile finishes is described which makes use of five different solvents, carbon tetrachloride, ethyl alcohol, water, dioxane and hydrochloric acid. A microscopical examination of the resin-treated fabric which is the first step toward the ultimate identification of the final and the refractive indices of the common fibers which are of value in detecting the resin are also presented. Cross section and tabular data are included.

Oxidizing with Textone

Gordon O. Smith. *American Dyestuff Reporter 42,* 429,30, 434 (July 6, 1953).

Textone sodium chlorite is finding increasing use in textile processing for carrying out various oxidative reactions, including bleaching, the oxidation of vat dyeings after application, and the stripping of dyeings, especially on nylon. Oxidation with Textone may be conducted in a solution either alkaline with bicarbonate or acid with formic or acetic acid. Oxidative processes with Textone may be carried out either batch-wise or continuously.

Shrink and crease resist finishes

Skinner's Silk and Rayon Record 27, 676; (June, 1953); B. P. 689,102.

A method is described by which a cellulose fiber fabric is impregnated with an aqueous solution containing a formaldehyde donor such as monomethyl dimethyl-hydantoin or dimethylhydantoin formaldehyde, a dimethylol urea precondensate in the presence of a selected organic or inorganic acid to secure a pH of 2.0 to 2.5 and then drying and curing at a temperature above 212° F. It is claimed that the fabric so treated acquired resistance to both shrinkage and creasing without incurring any appreciable loss of strength or wear value.

Water repellent textiles

Nico Ter. Kuile and Zonen N. V. B. P. 692,-900, (June 17, 1953).

Textile materials are rendered water-repellent by treating the material with a solution of a precondensate of a urea or thiourea formaldehyde resin and a paraffin emulsion containing a hydrolyzed protein which is not completely hydrolyzed to amino acids.

Water repellent treatment

S. F. Urban and W. B. Blumenthal (National Lead Co.); U. S. P. 2,641,558, (June 9, 1953).

A process for rendering fibrous materials

water-repellent comprises immersing the material in a bath containing ammonium dicarbonato zirconylate and a water soluble soap, and thereafter immersing the treated material in a salt solution which yields action of a metal.

Wool shrinkage control

Irving P. Hammer and John B. Rust (one-half to Montclair Research Corp. and one-half to Ellis-Foster Co.); U. S. P. 2,644,773 (July 7, 1953).

The method provides for shrink-proofing wool with water-insoluble polyamides while retaining substantially normal hand.

TESTING AND MEASUREMENT G

Instruments and Instrumentation G 2

Determination of twist

J. Lako. *Enka Breda Rayon Revue 7,* 87-90 (May, 1953); in Dutch.

The method of twist determination described is based on the indications laid down in the Bisfa-rules for rayon yarn, 1950. The apparatus required for this purpose, which has been developed by the instrument workshop of N. V. Research, is described in more detail. The apparatus proper is a universal apparatus, because it can be used for determining the twist of textile yarns and tire yarns, as well as of spun rayons.

Evenness testing

Paul W. Mullen. *Textile Industries 117,* 118-22, 125, 127, 131, 135 (July, 1953).

An article is presented, outlining the operational capabilities, characteristics, and accessories of several types of available evenness tests, and explaining various methods of interpreting tester charts, assuming the reader has no working knowledge of the apparatus being described.

Frictional properties of textile fibers

Bruce G. Hood. *Textile Res. J. 23,* 495-505 (July, 1953).

A means of measuring the relative frictional properties of individual textile fibers is described. The method developed consists of suspending the fibers to be measured from the alternating arms of the machine under any desired tension by applying weights to the ends of the fibers. By inserting twist, the fibers are brought into contact; they are rubbed together vertically by the arms, which move alternately up and down 180° out of phase. The turns of twist are then in-

creased until slippage of the fibers ceases. The number of turns of twist necessary to stop fiber slippage can be taken as an arbitrary unit of measure of the frictional resistance of the fibers being twisted.

Impact properties of yarn

H. F. Schiefer, Wm. D. Appel, J. D. Krasny and G. G. Richey. *Textile Res. J. 23,* 489-94 (July, 1953).

Yarns ranging from low tenacity and high elongation to high tenacity and low elongation were broken by impact loading and by static loading. The energy required to break each yarn under impact loading, "impact energy," and under static loading, "static energy"; the elongation at break; and the tenacity were measured or calculated. The findings have a bearing on the selection of yarns for the construction of safety belts, safety ropes, and certain aeronautical textiles which may be subjected to impact loading over a wide range of temperatures.

Measuring device

Fred P. Strother (Deering Milliken Research Trust); U. S. P. 2,641,960 (June 16, 1953).

The device indicates and records yarn diameters.

Measuring yarn diameters

T. M. M. (Research Ltd.); B. P. 691,491 (May 13, 1953).

Apparatus for measuring the diameter of yarn comprises a photoelectric cell, a source of light, means for traversing the yarn therebetween, an instrument for measuring the cell output and a stylus operated through the instrument which coacts with a moving chart.

Quality control in textile manufacture

H. Stein. *Textile-Praxis 8,* No. 4, 312,18 (1953); *in German; Brit. Cotton Ind. Res. Assoc. 33,* 408 (June 30, 1953).

A survey is made of the present state of testing technique and of the instruments available for the practical testing of the product at various stages of manufacture. The efficiency of these devices in enabling conclusions to be drawn as to the functioning of the various machines is discussed. Some lesser known, newly developed, measuring processes are also described. Among the instruments considered are included: various types of sliver and yarn regularity testers, electric tensile strength and elongation testing machines, yarn tension meters, and a stroboscopic device for observing shuttle behavior. Photographs and result charts are included.

Slub catcher for use on textile machinery

John Morris Shires and Bertram Gwynne Foster. U. S. P. 2,645,839 (July 21, 1953).

A slub catcher for use on textile machinery, comprising a fixed member mounted on the machine, an adjustable member slidable on the fixed member, closely adjacent paralled vertical edges on the fixed member and on the adjustable slubs on yarn passing through the slot, a pivoted gravity catch on the adjustable member and a peg on the gravity catch, the peg projecting through a curved slot in the adjustable member to limit the swing of the catch, and a spring fixed at one end on the adjustable member and bearing on the catch and to prevent any tendency of it to stick.

Super resin finishing range

Staff. *Textile Industries 117,* 97-99 (August, 1953).

Unusual speed of delivery of finished goods characterizes a versatile finishing range in operation at Fontaine Converting Works, commission dyers. The continuous range pads, drys, cures, washes, repads, and finally drys without interruption, at a speed of 65 yards per minute.

Testing apparatus

Rolf Bernegger (Cliffside Dyeing Corp.); U. S. P. 2,640,354 (June 2, 1953).

For testing the fading characteristics of textile material.

Two-dimensional load-extension tester

C. H. Reichardt, H. K. Woo and D. J. Montgomery. *Textile Res. J. 23,* 424-8 (June, 1953).

A two-dimensional load-extension tester for woven fabrics has been constructed. The apparatus imposes simultaneous extensions on a sample in two mutually perpendicular directions. A strain-sensing element measures the internal strain developed in the homogeneously strained regions as a function of the dynamically varying load. Preliminary results indicate important differences in behavior of fabrics under one-dimensional tests and under two-dimensional tests. The latter are believed to simulate better the conditions that a fabric sustains in actual use.

CHEMISTRY AND PHYSICS OF TEXTILE MATERIALS I

Acetylation of inclusion celluloses

Herman Staudinger and Wolfgang Dohle.

Makromol. Chem. 9, 188-89 (February, 1953); *in German; Resins, Rubbers and Plastics 7*, 439 (1953).

The acetylation of a homologous polymer series of mercerized cyclohexane inclusion celluloses from cotton and ramie with pyridine and acetic anhydride was carried out at 60° until all hydroxyl groups of the cellulose were acetylated. Tabular data is presented which shows that the homologous polymer series in mercerized cotton fibers have about the same rate of acetylation as ramie fibers. The differences in the acetylation rates is attributed to the reactivities of the various hydroxyl groups.

Alkaline degradation of polyacrylonitrile

J. R. McCartney. *Modern Plastics 30, 118*, 120, 122, 124, 179-81 (July, 1953).

In the course of research on polyacrylonitrile, it was found that concentrations of base of the order 10^{-3} normal in dilute polyacrylonitrile solutions produced rapid reductions in the intrinsic viscosity to 5 to 10% of the original value. The purpose of this paper is to present the results of a study of this reaction, believed to be unique with polyacrylonitrile, and a method utilizing this reaction for qualitatively defining molecular weight distribution of polyacrylonitrile. This method is applicable to any polymer that can be degraded in a controlled manner.

Crystallinity of cellulose

R. Gay. *Assoc. Tech. Ind. Papetiere Bull. 47*, P53-60 (1953); C. A. *47*, 6649 (July 10, 1953).

Work is outlined on the fine structure of cellulose and present day evidence for the existence of the crystallites is discussed and advantages of various x-ray techniques are outlined.

Degradation of cellulose

S. M. Mukherjee and H. J. Woods. *Biochim. et. Biophys. Acta 10*, 499-511 (1953); *C. A. 47*, 6649 (July 10, 1953).

Elongated tabular particles are formed on the degradation by H_2SO_4 solutions of cotton. The lateral dimensions of these particles were about 30 A x 130 A., and the length varied up to 2500 A. The particles are probably single crystallites of Cellulose I, and their 101 crystallographic planes are parallel to their largest faces. In the fiber these particles are arranged so that the crystallographic orientation persists over long distances. Cellulose II from mercerized fibers gave particles similar in appearance to those obtained from the native fibers.

Effect of daylight on periodate oxidation

Frank S. H. Head. *J. Textile Inst. 44*, T209-223 (May 1953).

Light accelerates the periodate oxidation of cellulose. It is doubtful whether the initial (Malaprade) stage of the oxidation is affected, but the rates of the subsequent "over-oxidation" reactions are greatly increased. With a moderate excess of periodate over the amount required for the Malaprade reaction, cotton cellulose suffers a progressive loss of weight when oxidized in daylight, but in the dark the loss does not become considerable until the Malaprade stage is passed. Oxidation beyond this stage leads to the formation of an increasing proportion of soluble products, and ultimately, a homogeneous, non-viscous solution is obtained. Formaldehyde and formic acid are formed in greater proportions than would be expected from oxidation of the terminal glucose units. The mechanism of the over-oxidation of cellulose is discussed.

Leveling-off DP of cotton and rayon

Mary L. Nelson and Verne W. Tripp. *J. of Polymer Science, 10*, 577-86 (June, 1953).

The effects of variations in hydrolytic conditions upon change in estimated DP of cotton linters and viscose rayon have been explored by varying the acid concentration downward over the range of 2.5 N to 0.01 N and by carrying out the hydrolysis at 100° and at 80°. It was observed that temperature and acid concentration do not affect appreciably the value obtained for the leveling-off DP although they do affect the rate of hydrolysis. An alternative way of determining the leveling-off DP has been devised. The moisture regain data on the hydrocelluloses indicate that cotton linters may recrystallize to a slight extent while rayon does so in significantly greater amount. This crystallization may take place either in the aqueous hydrolytic medium or during the drying of the hydrocellulose, the relative amount occurring at either stage being unknown.

Moisture regain of methylcellulose and cellulose acetate

G. C. Gibbons. *J. Textile Inst. 44*, T201-208 (May, 1953).

Measurements of the moisture regains at 65% and 80% or 85% r. h. of homogeneously substituted methylcelluloses and cellulose acetates of various degrees of substitution were found to increase initially and then decrease linearly with increasing degree of substitution. It is considered

that the linear relation shows the effect of substitution on the hygroscopicity of fully accessible cellulose and that on extrapolation to zero degree of substitution the intercept represents the proportion of water in fully accessible unsubstituted cellulose. Thus, fully accessible cellulose contains 1.53, 1.91, and 2.29 molecules of water per glucose unit at 65%, 80% and 85% r. h. respectively. For any specimen of cellulose the ratio of observed moisture regain to regain for fully accessible cellulose at the same r. h., gives the proportion of its hydroxl groups that are accessible to moisture

Polyacrylonitrile articles

Robert A. Scheiderbauer (E. I. duPont de Nemours and Co.); U. S. P. 2,643,934 (June 30, 1953).

A process for stabilizing a polyacrylonitrile article against discoloration by light comprises bleaching the article with a chlorine containing agent, impregnating the article with a phosphorous acid compound and heating the article.

Reinforcing textile

Leon Parker (The H. I. Thompson Co.); U. S. P. 2,643,437 (June 30, 1953).

A textile material is formed of silica filaments containing metallic oxides and other reinforcing filaments such as cotton, wool, nylon, cellulose acetate, etc.

Small-angle X-ray scattering from regenerated cellulose

H. Janeschitz-Kriegl and O. Kratky. *Z. Elektrochem. 57,* 42-50 (1953); *C. A. 47,* 6649, (July 10, 1953).

The degree of fiber swelling was measured by microscope in a special cell. The 1st series of samples included fibers swollen in hydrophobic liquids and a porous fiber prepared by pumping off the swelling agent from fibers swollen with petr. ether. The 2nd series was composed of porous fibers reswollen with the same liquids. The extent of reswelling decreased with the age of the fibers used to prepare the porous fibers. The small-angle X-ray patterns of samples from the two series were photographed with crystal-monochromatized X-rays. The intensities were measured by microphotometer and were placed on the same scale by various corrections.

Sodium carboxymethylcellulose

C. V. Francis. *Analytical Chemistry 25,* 941-3 (June, 1953).

The use of available methods of analysis for sodium carboxycellulose for active agent content

and degree of substitution has shown that no single method can be universally applied to all commercially available materials. A procedure using the uranyl ions as a precipitation agent, forming insoluble uranyl carboxymethylcellulose is discussed. The use of this procedure on a variety of sodium carboxymethylcellulose samples has shown a minimum recovery of 98% sodium carboxymethylcellulose and a precision within ± 0.01 on the degree of substitution. Comparison of degree of substitution obtained by this method and other available methods has shown a maximum difference of 0.04. This method has been found particularly useful in routine control analysis, as a total time of only 2 to 4 hours is required, and no special equipment or experience is necessary.

Transition from native to mercerized cellulose

H. Staudinger and W. Dohle. *Die Makromolekulare Chemie 9,* 190-2 (1953); *in German.*

The transition from native to mercerized cellulose by treatment with NaOH of various concs. was determined by measuring the rate of acetylation and was also followed by measuring the nitration number. No differences were found in the acetylation of inclusion celluloses between reactive amorphous and inert crystalline fractions; as in the partial acetylation of inclusion celluloses, the acetyl groups are uniformly distributed in the fiber. The result is in agreement with the macromolecular structure of the cellulose fibers in which the linear macromolecular is the decisive factor. The assumption of "x-ray crystalline" and "x-ray amorphous" areas of equal chemical reactivity is made.

Uniformity of carboxymethyl celluloses

T. E. Timell. *Svensk Papperstidning 56,* 311-23 (May 15, 1953); in English.

The chemical uniformity of several carboxymethylcelluloses has been studied by fractionation procedures. Fractional precipitation was found to take place according to both chemical constitution and molecular weight. This method, when applied to a technical carboxymethylcellulose, showed the material to be rather nonuniform in both respects. Application of a summative fractional solution procedure employing aqueous methanol solution resulted in fractions varying more in degree of substitution than in molecular weight. This method was applied to three commercial carboxymethylcelluloses and to a series of ten others prepared by carboxymethylation of cotton linters for varying lengths of time.

TEXTILE EDUCATION AND RESEARCH J

Behavior of optical bleaching agents on cellulosic materials

S. N. Glarum and S. E. Penner. *American Dyestuff Reporter 42,* 587 (August 31, 1953).

Although the physical and chemical properties of optical bleaches and their applications have been frequently presented in the literature, there seems to have been little utilization or recognition of the fundamental concepts underlying the behavior of optical bleaches on a fibrous, cellulosic substrate.

From theoretical concepts and empirical observations of fluorescent compounds in various systems, it is apparent that there should be a fundamental relationship between the concentration of an optical bleach on a textile substrate and the intensity of the visible light which is emitted when the system is subjected to a suitable ultra-violet source. Consideration of the experimental data obtained from applications of optical bleaches on cellulose indicates that the fluorescence-concentration relationships found to exist are consistent with certain theoretically derived mathematical expressions and analogous to other fluorescent compound-solvent systems. (AATCC Paper).

Counter for research work

Anon. *Textile Manufacturer 79,* 427 (August, 1953).

At the request of a large research organization, a new so-called "Stylus" counter was recently developed by the English firm of Trumeter Co., Ltd., at Radcliffe, and is now being used in laboratories, for the counting of colonies of micr-organisms. In the new model, a count is made through the Stylus to a magnetic counter, each count being accompanied by an audible click, and the instrument is fitted either with a propelling pencil or a special nib with ink reservoir. In the tedious process of counting micro-organisms, it is often difficult to avoid mis-counting, but with the new Trumeter counter, the count may be interrupted and later resumed without any possibility of error. Voltages for the instrument may be arranged to suit individual requirements.

Effects of atomic radiation on polymers

Leo. A. Wall and M. Magat. *Modern Plastics 30,* 111, 112, 114, 116, 178 (July, 1953).

The effects on solid polymers of exposure to atomic pile radiation and the degradation of solu-

tions by exposure to 2-rays from radium have been studied by the use of viscosity methods. In the former case variation of the structure of the polymer has been shown to cause both increases and decreases of molecular weight. When solutions of polymers were exposed to 2-rays, oxygen was found to be necessary for degradation. In this case, an after effect has been observed which is eliminated by the presence of inhibitor during the period of irradiation. The degradation appears to be a function of the square root of the number of radicals produced from the effects of 2-rays on the solvents used.

Factors influencing the soiling of acetate carpets

Fred Fortess and Charles E. Kip. *American Dyestuff Reporter 42,* 349-50 (June 8, 1953).

The most important single factor influencing the soiling of acetate carpets is mineral oil bonding. The lubricant on the original staple or the oily matter picked up during processing and held on the pile, binds soil particles to the carpet surface. A critical study of the carpet manufacturing process reveals that the use of petroleum or fatty carding oils, as well as the use of oily jute for the backing, is detrimental to the soiling characteristics of the carpet. Residual scouring agents and dyebath assistants are generally innocuous. Certain waxy lubricants can be successfully substituted for carding oils and these materials successfully block the effect of jute oil, while not increasing the soiling by other mechanism. The mechanism of jute oil migration to the pile is that of capillary wicking. Soil-resistant acetate carpets may be made by using low applications of a scourable staple lubricant, a waxy, nonsoiling carding oil substitute, and low oil jute for backing.

Hydrolysis of methylated cotton cellulose

Richard E. Reeves and Bernard J. Barrett. *Textile Res. J. 23,* 510-12 (July, 1953).

The acid-catalyzed, heterogeneous hydrolysis of a highly methylated cotton cellulose has been investigated, with particular attention to the effect of incorporating a wetting agent in the hydrolysis medium. It was found that the amount of fast-reacting material was small when the aqueous acid did not contain a wetting agent, but was increased severalfold in the presence of an active wetting agent. The rate constant for the slow-reacting material was also increased by the wetting agent. The minimum viscosity reached during hydrolysis was the same in the presence or in the absence of the wetting agent.

Photography as a textile tool

Melvin Siegel *Modern Textiles Magazine 34,* 32-33 (August, 1953).

Photographic studies by high-speed cameras have been used to analyze the operation of travelers on ring spinning, the motion of loom shuttles, loom bobbin transfer and other motions. Other new uses of photography such as photomicrography are described.

Reaction of polyacrylic acid with nylon

A. C. Nuessle and R. F. Crawford. *Textile Res. J. 23,* 462-8 (July, 1953).

It has been shown that polyacrylic acid can be heat-set onto nylon to impart a very durable crisp finish, the durability being proportional to the severity of cure. Actual chemical combination between the polyacrylic acid and the nylon appears likely, although the reaction mechanism has not been elucidated. Addition of glycerol (or certain other materials) will increase the durability at a given cure. The ability of glycerol alone to stiffen nylon, under proper conditions, has been demonstrated. The properties of the polyacrylic acid-treated fabric have been outlined, and the commercial value discussed.

Shrinkage of cotton fabrics—II

Hazel T. Stevens, Sarah M. Browning and Helen L. Richey. *Modern Textiles Magazine 34,* 78, 85, 86, 95 (August, 1953).

Although this study covers only a limited number of fabrics and laundering procedure, the constant difference between the results by the commercial colored and a home automatic process seems to indicate that there is a difference in shrinkage in woven cotton fabrics for different laundering procedures. In some cases this difference is not significant. However, when half of the fabrics show a difference as great as two percent it would seem that this might be important. Further investigation is indicated before conclusive results can be drawn.

The influence of preparation and method of dyeing and finishing on the color and colorfastness of vat-dyed cottons

Lester H. Bailey and Frank J. Rizzo. *American Dyestuff Reporter 42,* 492-512, (August 3, 1953).

The work reported in the previous sections suggest that, for any given dye method chosen, a set of preparatory conditions can be found which will result in the highest degree of colorfastness

possible for any given dye formulation. It is believed that the important consideration is proper distribution of the dye in relation to the fiber surface energy. Once this is achieved, whatever is the method, the colorfastness will be the best which a specific dye formulation will allow.

Within the preparation phase of this study it has been demonstrated that methods of boil-off influence colorfastness to about the same degree but that in general the kier boil is more effective than the progressive open boil-off and this in turn slightly better than the Mathieson method.

The greatest contribution to colorfastness is made by the degree of mercerization. Increasing the concentration of the caustic soda induces increased colorfastness, but the effect reaches a maximum at moderate caustic concentrations. Mercerization of the fabric while wet as it enters the caustic solution produces a lower degree of colorfastness presumably because of the dilution factor. The sequence of boil-off and mercerization is not too important. but there seems to be some evidence that the boil-off after mercerization tends to counteract the effect of the mercerization on colorfastness.

Chlorine bleaching produces poor colorfastness to laundering and to scrubbing.

Among the dye methods the pad-jig method results in the highest degree of colorfastness of the four methods explored. The continuous booster method of the four employed shows the poorest resistance to scrubbing and to laundering

The effect of a water-repellent treatment is beneficial in maintaining colorfastness and is more effective on those of lower initial colorfastness than on those of initially high ranking. The resinous types have a stronger effect than do the cationic types. This is particularly true in laundering in the presence of chlorine.

Wool research

Anon. *Textile Manufacturer 79,* 305 (June 1953).

The Wool Industries Research Association of Britain has announced a new research tool for the investigation of carding processes. The tool is an electrical analogue, so called because it is the counterpart of a card, but fed with electrical impulses instead of wool fibers. The levelness (evenness) of the roving coming out of the wool card is shown on a screen. The use of the analogue is said to save not only the expenditure of wool but also of time and tedious mathematical calculations.

One main use of the electrical analogue is to determine the effect of automatic controllers on the behavior of a card. With such a complicated machine as the card, it is not easy to determine whether or not an automatic control will oscillate or "hunt" to such an extent as to be useless, but with an electrical analogue machine an answer to these problems can be rapidly obtained.

A second analogue computer is thus being used in the development of a web levelness (evenness) tester. There are great possibilities in the field of carding research for such a device because of the large number of interactions that take place in a card. The machine enables the investigator to determine what happens to the quality of the product if any part of the card is modified even by such a small adjustment as a change in speed of one of the cylinders.

Other Wool Industries research described by the article include: scouring and combing, burr removal, bobbin weights, carding and yarn properties, and interesting use of radio-active atoms in the study of worsted drawing or gilling.

Briefly, this last research project shows what

happens to fibers when and while they are being drafted between the rollers of a gill box or drawing frame. Some fibers are impregnated with radio-active atoms, then run into a top sliver, where, apart from their radio-activity, the test fibers lose their identity after a few stages of drawing. This results in a sliver with occasional radio-active fibers embedded, and as the sliver is drafted, the passage of these radio-active fibers through the drafting zone can be easily followed by Geiger counters. This has shown just when and where fibers become speeded up from the speed of the back roll to the speed of the next roll, so that at last it is possible to see the movement of individual fibers in this critical process.

The information obtained is said to be of great use in formulating theories of drafting and in the design of improved drafting systems. The results are not what present theories might have anticipated, and this new insight into the movement of the fibers is rapidly giving a much more thorough understanding of how fibers are thinned down into rovings and yarns.